

2007 Compensatory Mitigation Monitoring Report

L.E. CARPENTER & COMPANY

***170 North Main Street
Block 301, Lot 1 and Block 801, Lot 3***
Borough of Wharton
Morris County, New Jersey

NJDEP File #1439-04-0001.1

Prepared for:



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JFNew Project #040229

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INTRODUCTION

L.E. Carpenter & Company (LEC) implemented a Remedial Action Work Plan (RAWP) for the impacted portion of their \pm 14.6-acre site (approximately 4.7 acres of disturbed area) located at 170 North Main Street, Borough of Wharton, Morris County, New Jersey (Figure 1). The site comprises Block 301, Lot 1 and Block 703, Lot 30 on the Borough of Wharton tax map. The project area is located in the USGS Dover, New Jersey quadrangle with center state plane coordinates of N 754326.5 E 470891.83 (NAD 1983) (Figure 2). A 2002 aerial photograph of the project site is also included (Figure 3).

Due to the parcel's previous utilization for mining and forging throughout the 1700's and 1800's, and vinyl manufacturing from 1943 to 1987, contaminated soils and groundwater were identified on the site. RMT, Inc. (RMT), on behalf of LEC, worked with the U.S. Environmental Protection Agency (USEPA) and the New Jersey Department of Environmental Protection (NJDEP) to implement the RAWP for those impacted areas of the property.

As part of the RAWP, several "Hot Spots" (areas exhibiting either inorganic or organic contaminant concentrations in soil in excess of the 1994 Record of Decision (ROD) cleanup criteria) were identified across the site for removal. Several areas identified for contaminant removal overlapped with jurisdictional wetlands on site. A total of 0.337 acre of jurisdictional wetlands was temporarily impacted as a result of site remediation activities (Figure 4). This acreage consisted of a 0.003 acre and 0.009 acre lobe of forested/scrub-shrub wetland on site, 0.286 acre of forested/scrub-shrub and emergent marsh wetland to the east on the Wharton Enterprise property, and 0.039 acre of the Air Products open-water drainage channel relocation to the northeast. Due to the fact that project activities and wetlands extend off site onto adjacent properties, the project area or site referenced in this plan includes the LEC parcel, several acres of the Wharton Enterprises parcel to the east, and the Air Products drainage channel to the northeast.

Upon completion of cleanup activities, the entire 0.337 acre of wetland disturbance was restored and enhanced as more diverse emergent wetland communities. All temporary wetland impacts were restored and mitigated for at their current locations. A Wetland Mitigation Construction Final Report, dated August 28, 2005, was submitted to the NJDEP upon completion of restoration activities.

The main source of hydrology for the restored wetland is a direct surface water flow from the Rockaway River. The wetland area was restored to pre-cleanup grades. The intention was to restore and enhance the pre-existing wetland so that there is no-net loss of wetlands as a result of the clean-up work completed by LEC.

The primary means through which wetland vegetation will be established in the mitigation area is through planting native seed and bare root stock trees, as well as natural colonization from the adjacent wetland areas. For a list of planted species within the mitigation area and transition zone, see Appendix A.

MONITORING

Annual monitoring of the mitigation area is proposed for five years, unless it is apparent the wetland has been successfully established sooner, upon which case the permittee will propose elimination of any subsequent reports in writing to the NJDEP. Only upon written concurrence from the NJDEP will any reporting requirements be eliminated.

LEC will submit annual reports to the NJDEP by December 31 of each monitoring year in accordance with the requirements outlined in the NJDEP Mitigation Project Monitoring Reports Checklist for Completeness. The monitoring reports will, at a minimum, include the following:

1. Photographs of the wetland mitigation areas.
2. Assessment of vegetative communities and evaluation of whether a dominance of wetland species exists (according to federal wetland indicator status of species identified).
3. Wildlife utilization evaluation.
4. Hydrology evaluation.
5. Soil evaluation.
6. Sediment loading evaluation.
7. Evaluation of sideslope and transition area conditions. Evaluation of overall progress toward successful achievement of wetland creation as designed, per each of the performance standards dictated for the project. Perform a comparative assessment between existing conditions and the performance standards.

This document will serve as the third annual monitoring report.

METHODS

A spring site visit was completed on May 15, 2007 followed by a thorough review of the mitigation site on September 20, 2007. During the May visit, conditions were sunny and 80° F while conditions were sunny and 85° F during the September site visit. Two site visits (June 26 and August 1) were also conducted to chemically treat the invasive species of purple loosestrife (*Lythrum salicaria*) and reed canary grass (*Phalaris arundinacea*) in 2007. The wetland was walked using the random meander method. All plant species encountered during the walk-through were recorded on inventory data sheets until no new plant species were observed (Appendix B). Plant names were used as listed in Gleason and Cronquist (1991).

Three permanent transects were set up in order to measure percent cover of vegetation in the wetland (Figure 4). Several 1-m² plots were laid along the transect in order to measure the vegetative cover. A percent cover value was assigned to each species found in the plots. Total vegetative cover was calculated by averaging the vegetative cover from each plot along the transect (Appendix B).

Information on hydrology was collected using evidence provided by soil pits. Permanent reference points were established at the beginning of each transect so that water levels can be

recorded in the same location from year-to-year. The site was also inspected for problems such as erosion, sedimentation, and water quality issues. Signs of wildlife use were also recorded during the walk-through. Finally, reference points were established from which to take photographs.

VEGETATIVE COMMUNITY

The data from the plots was used to describe the vegetative cover. Of the total wetland and transition areas, an average of 84% was vegetated and the remaining 16% was bare soil. The total vegetative cover in the emergent and forested zones is approximately the same as it was in the first year of monitoring. Vegetative cover in the transition zone has increased each year, and is currently fully vegetated along the transect. The number and percent of native wetland indicator species in the emergent zone has increased each year, while in the forested zone, the number and levels are similar to 2005. The number of species within the transition zone has steadily increased each year. Dominant species, based on relative cover (RC), in the emergent zone include goose grass (*Eleusine indica*) (23.4% RC), arrow leaved tear thumb (*Polygonum sagittatum*) (8.0% RC), grass-leaved goldenrod (*Euthamia graminifolia*) (7.8% RC), purple loosestrife (*Lythrum salicaria*) (7.4% RC), barnyard grass (*Echinochloa crusgalli*) (6.0% RC), and redtop (*Agrostis gigantea*) (6.0% RC). Dominant species in the forested/scrub-shrub zone include goose grass (19.5% RC), sneezeweed (*Helenium autumnale*) (15.5%), grass-leaved goldenrod (6.9%), common plantain (*Plantago major*) (5.5% RC), and barnyard grass (5.5% RC). Dominant species in the transition zone include goose grass (27.0% RC), white clover (*Trifolium repens*) (9.1% RC), grass-leaved goldenrod (8.6% RC), and Bermuda grass (*Cynodon dactylon*) (7.6% RC).

Table 1. A summary of species diversity in the emergent zone

Year	Total # Species	# Native Wetland Indicator Species (NWIS)	# Native Species	Percent Vegetative Cover	Percent Actual Vegetative Cover by NWIS
2005	49	19 (39%)	29 (59%)	77%	11%
2006	46	24 (52%)	31 (67%)	90%	38%
2007	56	36 (64%)	44 (79%)	78%	31%

Table 2. A summary of species diversity in the forested/scrub-shrub zone

Year	Total # Species	# Native Wetland Indicator Species (NWIS)	# Native Species	Percent Vegetative Cover	Percent Actual Vegetative Cover by NWIS
2005	51	23 (45%)	34 (67%)	82%	10%
2006	53	29 (55%)	41 (77%)	98%	26%
2007	54	23 (43%)	36 (67%)	82%	41%

Table 3. A summary of species diversity in the transition zone

Year	Total # Species	# Native Wetland Indicator Species (NWIS)	# Native Species	Percent Vegetative Cover
2005	37	7 (19%)	19 (51%)	62%
2006	49	10 (31%)	28 (57%)	94%
2007	63	19 (30%)	39 (62%)	100%

The following invasive species were observed within the mitigation wetlands during the 2007 monitoring visit: reed canary grass (*Phalaris arundinacea*) and purple loosestrife (*Lythrum salicaria*). These species were located in a strip approximately 10' wide around the north and east border of the emergent zone, and were apparently increasing in cover. In the emergent zone, purple loosestrife increased from 5.7% RC in 2006 to 7.4% RC in 2007, while reed canary grass increased from 0.5% RC in 2006 to 3.4% RC in 2007. In the forested zone, purple loosestrife decreased from 5.3% RC in 2006 to 4.2% RC in 2007. Reed canary grass remained absent from the transect data in the forested area. These species will continue to be selectively treated using wetland-approved herbicides. Annual treatments will be performed twice each year through September 2009, or until all invasive populations have been effectively controlled.

All of the planted bareroot trees and shrubs have died. Late season installation (June 28, 2005), drought conditions, and deer predation were likely contributors to the death of the installed trees. A replant of 250 bareroot trees with predator guards is planned to encourage sufficient coverage to meet mitigation requirements. Due to the fact that additional monitoring wells are required to be installed in this area, this supplemental planting should take place after well installation during the spring of 2008 (April or May).

The overall coverage by wetland indicator species continues to increase over time. During the 2007 growing season, a dramatic increase in the presence of seeded species was observed. It is anticipated that wetland indicator species will continue to increase as the mitigation wetland develops. While Canada Goose individuals were observed at the site during the spring visit, it appeared that little damage had been done to the vegetation between the two visits. Sneezeweed was one of the conspicuous native wetland indicator species present in numbers much larger than those seen in previous visits. Future monitoring visits will include further assessment of the development of native wetland vegetation at the site.

MAINTENANCE

Invasive or noxious vegetation can oftentimes prevent or hinder the successful establishment of native species in a wetland mitigation area. For this reason, a routine wetland maintenance program is being implemented at the LEC project site. This program includes semi-annual site visits to assess and treat (if necessary) any invasive species found on the property. Based on knowledge of the site and adjacent communities, chemical applications have been selected as the most effective maintenance tool for control of invasive species. Invasive species on the site were chemically treated on June 26 and August 1, 2007.

Any potential browsing damage by herbivores will be noted and addressed during routine maintenance site visits. Should the need arise, deer or goose fencing will be erected around the seeded areas to promote growth and restrict grazing or browsing.

Subsequent to permit issuance and after the restored wetland areas had been planted, several federal agency personnel raised a concern over the use of barnyard grass (*Echinochloa crusgalli*) in the wetland restoration seed mix. Due to the fact that several respected botanical sources disagree on the status of barnyard grass as a native versus non-native species, it was decided that barnyard grass populations on the project site will be monitored. If at any time it is determined that barnyard grass is having a detrimental effect on the mitigation area or prohibiting the establishment of other native species, it will be effectively controlled during the semi-annual maintenance site inspections. At this time, barnyard grass does not appear to be a long-term concern.

HYDROLOGY AND WATER QUALITY

Site conditions in 2007 were wetter than in 2005, and slightly drier than in 2006. Hydrology ranged from moist soil to pockets of inundation up to 2" deep. At the eastern end of the emergent zone transect, a soil pit was dug to inspect hydrology. During the September site visit, the soil was saturated in this region at the surface. At the eastern end of the forested zone transect, the soil was inundated up to 0.5" above the surface. At the western end of the emergent zone, no saturation was found within 16" of the soil surface. At the western end of the forested zone, saturation occurred at approximately 16" below the soil surface.

WILDLIFE HABITAT

Evidence of wildlife use was present in the mitigation wetland. The presence of white-tailed deer and Canada Goose continue to be evident, though herbivory by these species does not appear to have caused detrimental harm to the herbaceous species. The complete loss of all planted tress may be directly related to the herbivory by white-tailed deer. As the mitigation site progresses and the wetland vegetation becomes dominant, it is expected that the wildlife observations will continue to increase, and the desired goal of creating wildlife habitat within the mitigation area will be achieved.

Table 5. Comprehensive list of wildlife observations in the mitigation wetland

SCIENTIFIC NAME	COMMON NAME
BIRDS	
<i>Cyanocitta cristata</i>	Blue Jay
<i>Buteo jamaicensis</i>	Red-Tailed Hawk
<i>Branta canadensis</i>	Canada Goose*
<i>Zenaida macroura</i>	Mourning Dove*
<i>Colaptes auratus</i>	Northern Flicker
AMPHIBIANS	
<i>Rana clamitans</i>	Green frog*
MAMMALS	

<i>Odocoileus virginianus</i>	White-tailed deer*
INSECTS	
<i>Papilio glaucus</i>	Tiger swallowtail

*Observed in 2007

SOILS

During the 2007 site visit, soil characteristics and textures were not specifically examined due to the fact that this had previously been done in June 2005. Results of the soil profile review were presented in the Wetland Mitigation Construction Final Report, dated August 28, 2005, and are again presented below.

Table 6. Soil profile review

	Soil Depth	Munsell Soil Color	Soil Texture
Boring 1 (40.54.15.00748N 74.34.31.41719W)	0-10" 10-20"	10YR 4/3 10YR 3/3	Loam Loam
Boring 2 (40.54.14.42438N 74.34.31.14259W)	0-13" 13-20"	10YR 4/2 10YR 3/2	Loamy clay Loamy clay
Boring 3 (40.54.13.75148N 74.34.31.31904W)	0-15" 15-20"	10YR 4/3 10YR 3/1	Loam Loamy clay
Boring 4 (40.54.13.94790N 74.34.29.98567W)	0-2" 2-20"	10YR 4/3 10YR 3/2	Loam Loam
Boring 5 (40.54.14.63046N 74.34.29.45719W)	0-9" 9-20"	10YR 4/3 10YR 3/2	Loam Loam
Boring 6 (40.54.12.80847N 74.34.34.70682W)	0-20"	10YR 3/3	Loam

SEDIMENTATION AND EROSION CONTROL

There were no signs of erosion problems on the days the site was investigated. The potential for erosion issues has decreased due to the site's increased vegetative cover. It is expected that as the vegetative cover of the mitigation area continues to increase, the potential for erosion will be effectively eliminated.

CONCLUSIONS

The mitigation area was constructed during an extremely dry growing season, and late installation of seed and bare root trees, as well as herbivory by white-tailed deer and Canada

Goose, were causes for the slow development of the mitigation wetland areas. The actual percent cover by native wetland species has increased since construction of the site, but still remains lower than the required 85% cover by native wetland species. It is anticipated that the additional seeding of wetland species proposed after the installation of monitoring wells in the mitigation area should meet the requirements by the end of the monitoring period.

At this time, it is recommended that LEC proceed with the planned following steps.

1. Plant at least 250 additional bareroot trees in the spring of 2008.
2. Continue maintenance visits for invasive species control to eliminate or effectively control their presence in the wetland mitigation area. LEC currently has a 5-year maintenance plan contract in place that includes semi-annual visits.

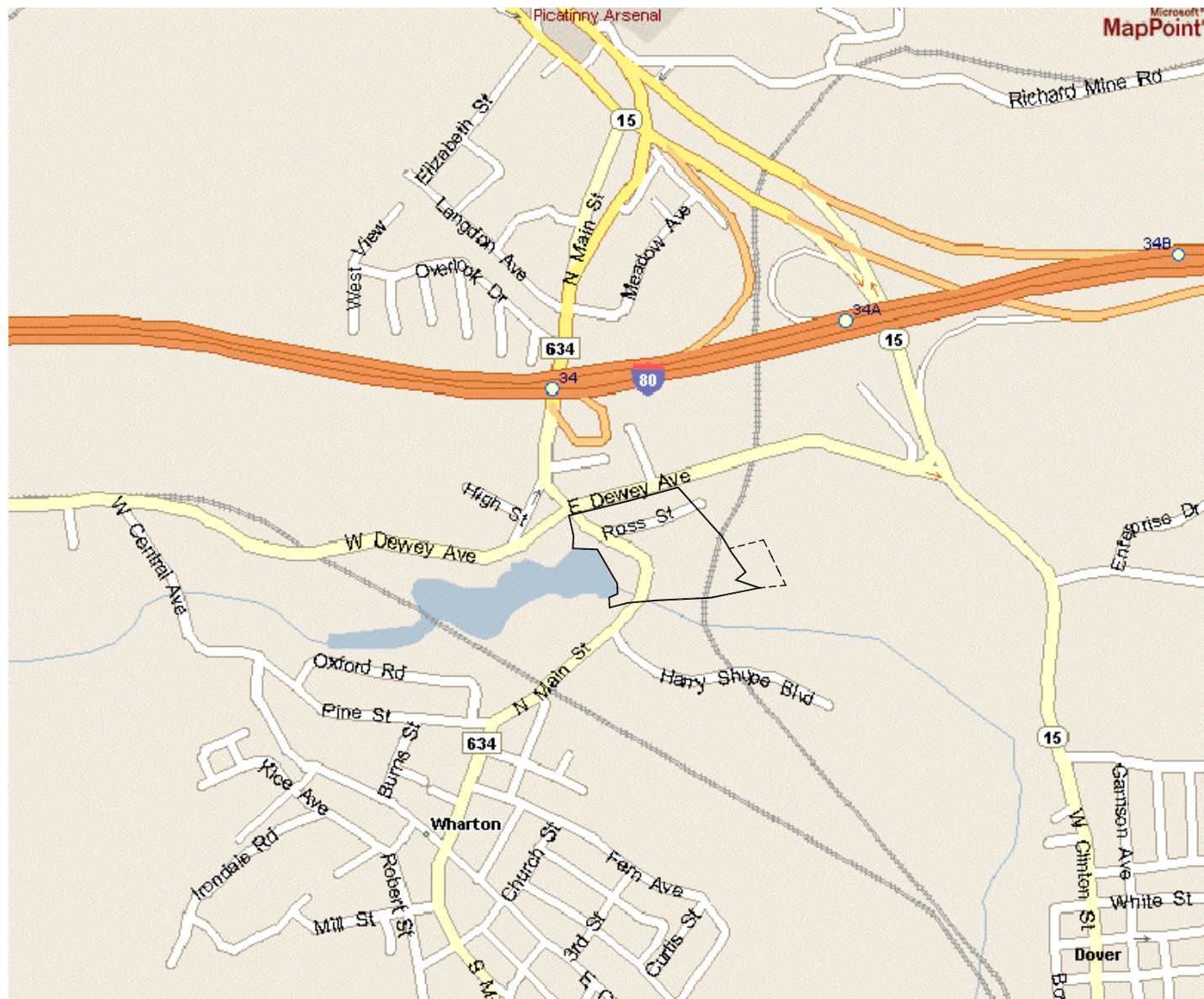
Due to the fact that wetland communities surrounding the mitigation site and elevations were restored to pre-existing contours with no impedance to surface or groundwater flow, we expect that wetland and transition zone restoration will continue to progress and be successful. This was seen in the results of the emergent and forested wetland areas with an increase in total cover by wetland indicator species in both of these areas.

It should be noted that the remedial action work plan for the LEC site was altered in 2006 and the need for additional groundwater monitoring wells located in the mitigation area was confirmed. From late summer through the end of the year, permit modifications were being pursued by RMT, Inc. Due to the fact that the installation of additional monitoring wells will involve mitigation area site disturbance, supplemental planting of trees was put on hold. Newly installed trees would have been run over by well installation equipment and resulted in duplicate replanting efforts. As soon as all required permit modifications are obtained from the NJDEP LURP, it is anticipated that the additionally required monitoring wells will be installed and supplemental planting will be completed. At the current time, it is anticipated that all required permit modifications will be obtained in the near future and wells should be installed shortly thereafter. This will allow ample time for an effective spring 2008 tree planting event along with reseedling of the areas disturbed by well installation activities.

REFERENCES

Gleason, Henry and Arthur Cronquist. 1991. *Manual of Vascular Plants of North-eastern United States and Adjacent Canada*. D. Van Nostrand Company, New York, New York. 910 pp.

Figures



LEGEND



- APPROXIMATE PROPERTY BOUNDARY



- EXPANDED PROJECT AREA

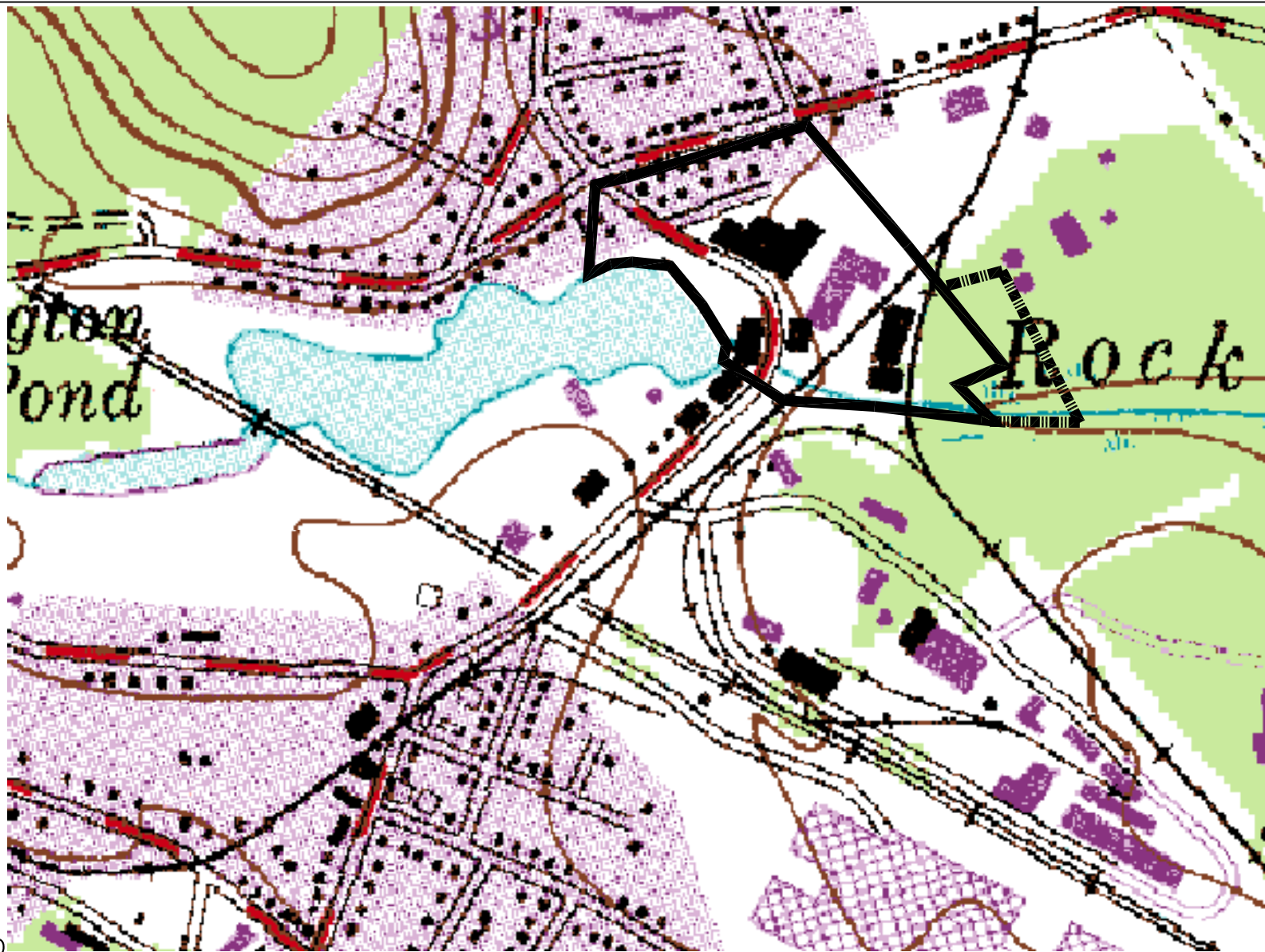


FIGURE 1 - LOCATION MAP

L.E. CARPENTER
 WHARTON, NEW JERSEY



SCALE: NTS
 DATE: 09.23.04
 FILE: 040229LocationMap



LEGEND



- APPROXIMATE PROPERTY BOUNDARY



- EXPANDED PROJECT AREA

NOTES

STATE PLANE COORDINATES -
754326.58N 470891.83E (NAD83)

SOURCE:USGS DOVER,NJ QUADRANGLE

HUC-14 CODE 02030103030070



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FIGURE 2 - USGS MAP

L.E. CARPENTER
WHARTON, NEW JERSEY



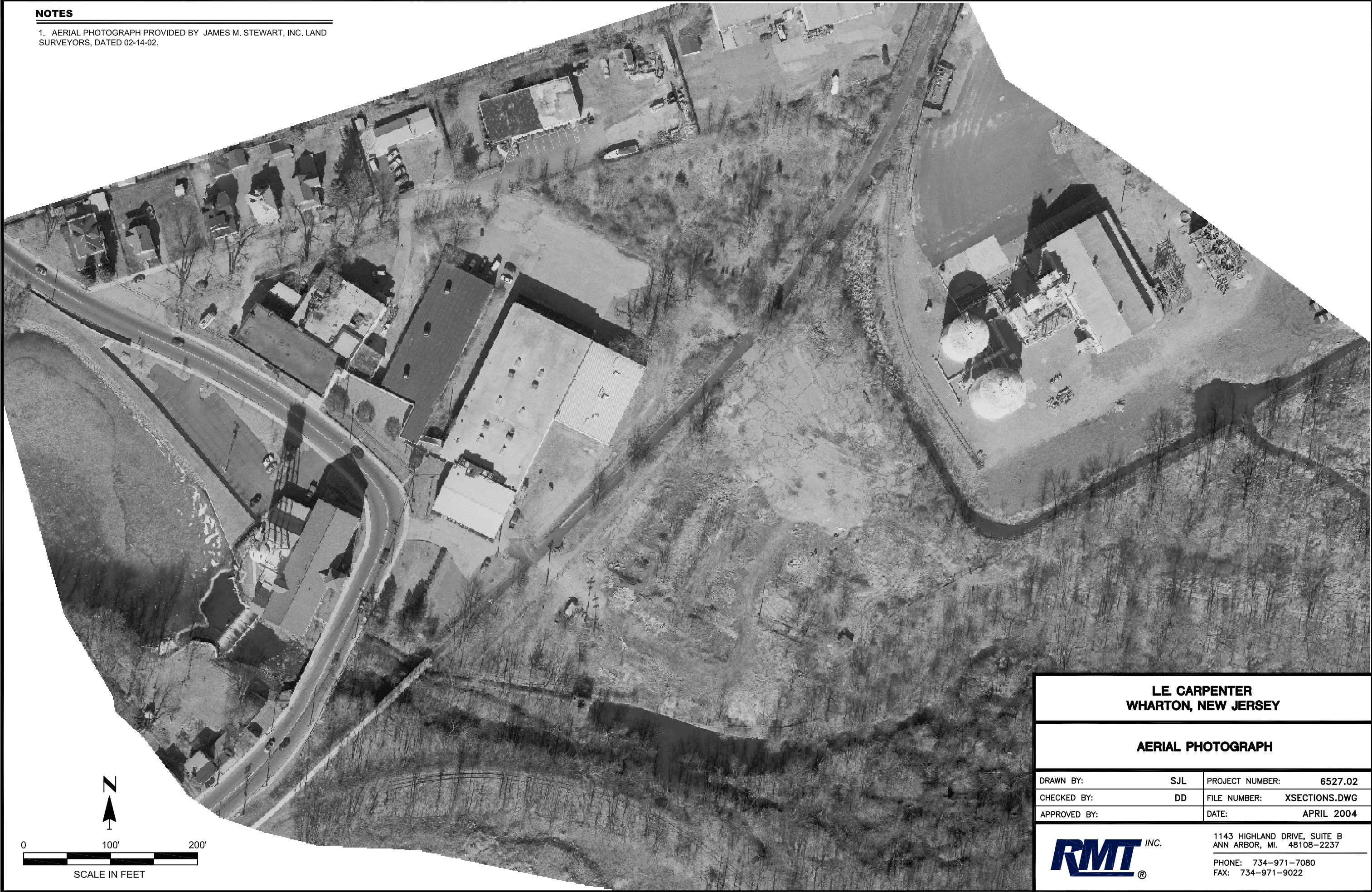
SCALE: NTS

DATE: 12.12.2005

FILE: 040229USGSmap

NOTES

1. AERIAL PHOTOGRAPH PROVIDED BY JAMES M. STEWART, INC. LAND SURVEYORS, DATED 02-14-02.



LE. CARPENTER
WHARTON, NEW JERSEY

AERIAL PHOTOGRAPH

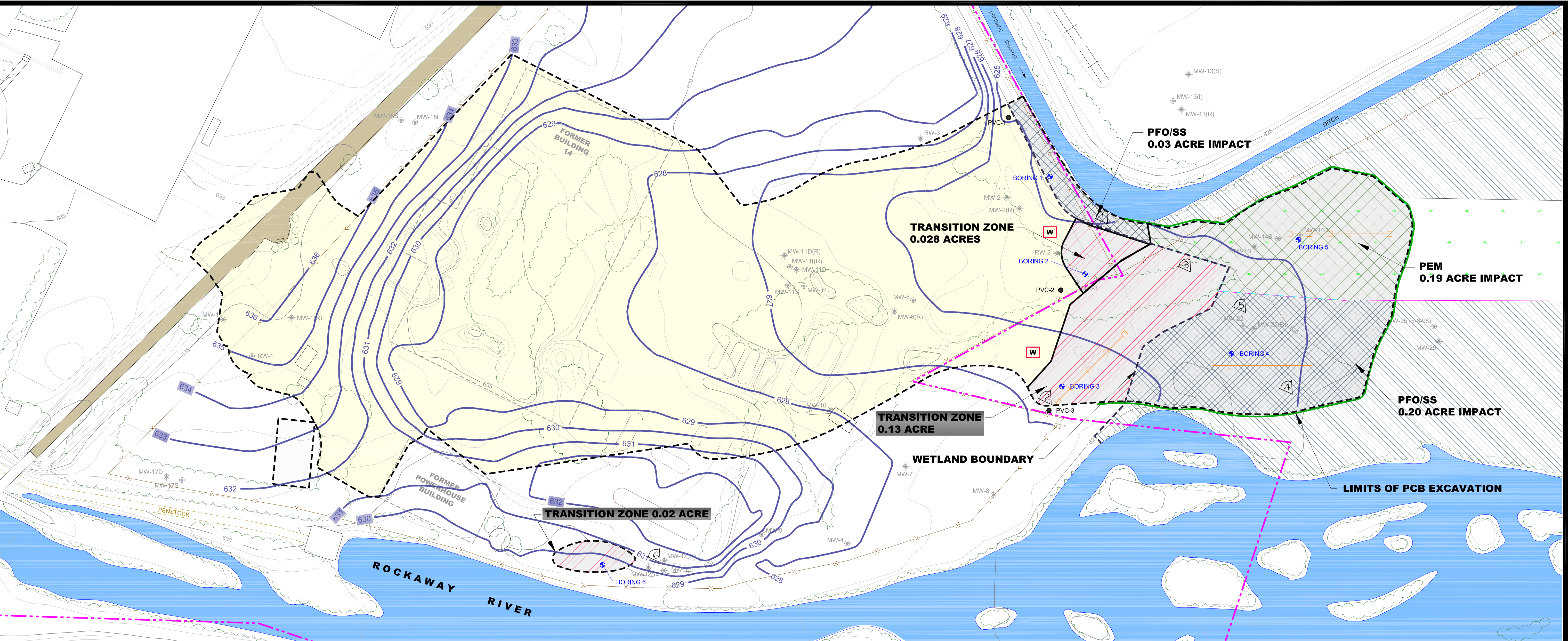
DRAWN BY:	SJL	PROJECT NUMBER:	6527.02
CHECKED BY:	DD	FILE NUMBER:	XSECTIONS.DWG
APPROVED BY:		DATE:	APRIL 2004



1143 HIGHLAND DRIVE, SUITE B
ANN ARBOR, MI. 48108-2237
PHONE: 734-971-7080
FAX: 734-971-9022

PLOT DATA
Drawing Name: J:\06527\02\Xsections.dwg
Operator Name: Lucido
Scale: Shown
Dwg Size: 90407 Bytes
Plot Date: April 2004
Plot Time: 1:47.4266 PM
Attached Xref's: No xref's Attached.

FIGURE 3



EMERGENT WETLAND (PEM) SEED MIX (0.19 acre)		
NATIVE COMPONENT		
Scientific Name	Common Name	Ounces/Acre
<i>Acorus calamus</i>	Sweet flag	8.50
<i>Alisma subcordatum</i>	Common water plantain	8.00
<i>Echinochloa crusgalli</i>	Barnyard grass	12.00
<i>Eleocharis obtusa</i>	Blunt spike rush	3.00
<i>Iris virginica shrevei</i>	Blue flag iris	4.00
<i>Juncus effusus</i>	Soft rush	3.00
<i>Leersia oryzoides</i>	Rice cut grass	4.00
<i>Lobelia cardinalis</i>	Cardinal flower	0.75
<i>Lobelia siphilitica</i>	Great blue lobelia	1.00
<i>Mimulus ringens</i>	Monkey flower	2.00
<i>Peltandra virginica</i>	Arrow arum	16.00
<i>Polygonum pensylvanicum</i>	Pinkweed	6.00
<i>Pontederia cordata</i>	Pickersweed	8.00
<i>Sagittaria latifolia</i>	Common arrowhead	8.00
<i>Scirpus validus</i>	Softstem bulrush	6.00
<i>Sparganium eurycarpum</i>	Common burreed	10.00
TOTAL		100.25 oz/acre
		= 6.27 lbs/acre
TEMPORARY COVER COMPONENT		
Scientific Name	Common Name	Ounces/Acre
<i>Agrostis alba</i>	Redtop	16.00
<i>Lolium multiflorum</i>	Annual rye	400.00
TOTAL		416.00 oz/acre
		= 26.00 lbs/acre

SLOPE STABILIZATION SEED MIX (0.21 acre)		
NATIVE COMPONENT		
Scientific Name	Common Name	Ounces/Acre
<i>Andropogon gerardii</i>	Big bluestem	20.00
<i>Andropogon scoparius</i>	Little bluestem	32.00
<i>Bouteloua curtipendula</i>	Side-oats grama	3.00
<i>Elymus canadensis</i>	Canada wild-rye	5.00
<i>Panicum virgatum</i>	Switch grass	12.00
<i>Sorghastrum nutans</i>	Indian grass	24.00
TOTAL		96.00 oz/acre
		= 6.00 lbs/acre
TEMPORARY COVER COMPONENT		
Scientific Name	Common Name	Ounces/Acre
<i>Agrostis alba</i>	Redtop	16.00
<i>Elymus hystrix</i>	Eastern bottlebrush grass	64.00
<i>Lolium multiflorum</i>	Annual rye	400.00
TOTAL		480.00 oz/acre
		= 30.00 lbs/acre

WOODED WETLAND UNDERSTORY SEED MIX (0.20 acre)		
NATIVE COMPONENT		
Scientific Name	Common Name	Ounces/Acre
<i>Actinomeris alternifolia</i>	Wingstem	1.00
<i>Alisma subcordatum</i>	Common water plantain	3.00
<i>Aster umbellatus</i>	Flat-top aster	1.25
<i>Bidens cernua</i>	Nodding bur marigold	3.00
<i>Calamagrostis canadensis</i>	Blue joint grass	3.00
<i>Carex crinita</i>	Fringed sedge	2.00
<i>Carex hystericina</i>	Porcupine sedge	4.00
<i>Carex lupulina</i>	Common hop sedge	4.00
<i>Carex vulpinoidea</i>	Fox sedge	6.00
<i>Chelone glabra</i>	Turtlehead	1.25
<i>Elymus canadensis</i>	Canada wild rye	6.00
<i>Elymus virginicus</i>	Virginia wild rye	12.00
<i>Glyceria striata</i>	Fowl manna grass	4.00
<i>Helianthus autumnale</i>	Sneezeweed	1.50
<i>Leersia oryzoides</i>	Rice cut grass	2.00
<i>Lobelia siphilitica</i>	Great blue lobelia	1.50
<i>Mimulus ringens</i>	Monkeyflower	1.75
<i>Panicum virgatum</i>	Switch grass	2.50
<i>Rudbeckia laciniata</i>	Wild golden glow	0.75
<i>Scirpus atrovirens</i>	Dark green rush	6.00
<i>Spartina pectinata</i>	Prairie cord grass	4.00
TOTAL		70.50 oz/acre
		= 4.41 lbs/acre
TEMPORARY COVER COMPONENT		
Scientific Name	Common Name	Ounces/Acre
<i>Agrostis alba</i>	Redtop	16.00
<i>Elymus hystrix</i>	Eastern bottlebrush grass	64.00
<i>Lolium multiflorum</i>	Annual rye	400.00
TOTAL		480.00 oz/acre
		= 30.00 lbs/acre

BARE ROOT TREES (PFO/SS WETLAND) (0.20 acre)		
Scientific Name	Common Name	Quantity
<i>Acer saccharum</i>	Silver maple	25
<i>Betula nigra</i>	River birch	25
<i>Fraxinus pennsylvanica</i>	Green Ash	25
<i>Quercus palustris</i>	Pin oak	25
TOTAL		125
BARE ROOT SHRUBS (CHANNEL SLOPE STABILIZATION) (0.03 acre)		
Scientific Name	Common Name	Quantity
<i>Cornus obliqua</i>	Silky Dogwood	50
<i>Salix discolor</i>	Pussy Willow	50
TOTAL		100

BARE ROOT TREES (TRANSITION ZONE) (0.18 acre)		
Scientific Name	Common Name	Quantity
<i>Acer saccharum</i>	Sugar Maple	25
<i>Juglans nigra</i>	Black Walnut	25
<i>Liriodendron tulipifera</i>	American elm	50
<i>Quercus rubra</i>	Northern red oak	50
TOTAL		150
LEGEND		
APPROXIMATE PROPERTY LINE		
FENCE LINE		
TREES		
FINAL GRADE CONTOUR LINE		
WETLAND RESTORATION AND TRANSITION ZONE BOUNDARY POINTS MARKED IN THE FIELD WITH 3-foot LENGTHS OF 3-inch WHITE PVC; LURP Special Condition 11c		
BORING 1: NUDEP LURP REQUIRED SOIL BORINGS, Permit Condition 11e		
AREA OF SOURCE REDUCTION DISTURBANCE OUTSIDE OF REGULATED WETLAND AREA		
STATE OPEN WATERS		
WETLAND BOUNDARY		
LIMITS SOURCE REDUCTION PCB EXCAVATION WITHIN REGULATED WETLAND AREA		
PEM (EMERGENT WETLAND)		
PFO / SS (FORESTED / SCRUB-SHRUB WETLAND)		
PFO / SS IMPACT (0.23 ACRE)		
PEM IMPACT (0.19 ACRE)		
TRANSITION ZONE IMPACT (0.18 ACRE)		

SAMPLE OR MONITORING LOCATION AND NUMBER

MW-21	MONITORING WELL LOCATION AND NUMBER
TRANS	TRANSECT LOCATION WITH PLOTS
PHOTO	PHOTOSTATION LOCATIONS

WETLAND SIGN LOCATION

W	WETLAND MITIGATION PROJECT SIGN
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NOTES

- BASE MAP DEVELOPED FROM TOPOGRAPHIC SURVEY PROVIDED BY JAMES M. STEWART, INC. LAND SURVEYORS, DRAWING NO 2793-03.DWG, DATED 02-14-02.
- TOTAL PROPOSED WETLAND IMPACT 0.42 ACRE.
- PROPOSED DENSITY FOR TREE RESTORATION IS 10' ON CENTER.

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5.				
4.				
3.				
2.				
1.				
NO.	BY	DATE	REVISION	APP'D.

L.E. CARPENTER
WHARTON, NEW JERSEY

MITIGATION MONITORING MAP

DRAWN BY: SJL	SCALE:	PROJECT NO. 6527.16
CHECKED BY: NC	SHOWN	FILE NO. 6527.16.01.DWG
APPROVED BY:	DATE PRINTED:	FIGURE 4
DATE: AUGUST 2005		

1143 HIGHLAND DRIVE, SUITE B
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Appendices

Appendix A: Planting List

EMERGENT WETLAND IMPACT AREA (0.19 acre)

Emergent Wetland Seed Mix (32.27 pounds/acre)

Native Component

<u>Scientific Name</u>	<u>Common Name</u>	<u>Ounces/Acre</u>
<i>Acorus calamus</i>	Sweet flag	8.50
<i>Alisma subcordatum</i>	Common water plantain	8.00
<i>Echinochloa crusgalli</i>	Barnyard grass	12.00
<i>Eleocharis ovata</i>	Blunt spike rush	3.00
<i>Iris virginica shrevei</i>	Blue flag iris	4.00
<i>Juncus effusus</i>	Soft rush	3.00
<i>Leersia oryzoides</i>	Rice cut grass	4.00
<i>Lobelia cardinalis</i>	Cardinal flower	0.75
<i>Lobelia siphilitica</i>	Great blue lobelia	1.00
<i>Mimulus ringens</i>	Monkey flower	2.00
<i>Peltandra virginica</i>	Arrow arum	16.00
<i>Polygonum pensylvanicum</i>	Pinkweed	6.00
<i>Pontederia cordata</i>	Pickernelweed	8.00
<i>Sagittaria latifolia</i>	Common arrowhead	8.00
<i>Scirpus validus</i>	Softstem bulrush	6.00
<i>Sparganium eurycarpum</i>	Common burreed	<u>10.00</u>
TOTAL NATIVE FORBS AND GRASSES		100.25 = (6.27 lbs/acre)

Temporary Cover Component

<u>Scientific Name</u>	<u>Common Name</u>	<u>Ounces/Acre</u>
<i>Agrostis gigantea</i>	Redtop	16.00
<i>Lolium perenne</i>	Annual rye	<u>400.00</u>
TOTAL		416.00 = (26.00 lbs/acre)

FORESTED/SCRUB-SHRUB IMPACT AREA (0.20 acre)

Wooded Wetland Understory Seed Mix (34.41 pounds/acre)

Native Component		
<u>Scientific Name</u>	<u>Common Name</u>	<u>Ounces/Acre</u>
<i>Alisma subcordatum</i>	Common water plantain	3.00
<i>Aster umbellatus</i>	Flat-top aster	1.25
<i>Bidens cernua</i>	Nodding bur marigold	3.00
<i>Calamagrostis canadensis</i>	Blue joint grass	3.00
<i>Carex crinita</i>	Fringed sedge	2.00
<i>Carex hystericina</i>	Porcupine sedge	4.00
<i>Carex lupulina</i>	Common hop sedge	4.00
<i>Carex vulpinoidea</i>	Fox sedge	6.00
<i>Chelone glabra</i>	Turtlehead	1.25
<i>Elymus canadensis</i>	Canada wild rye	6.00
<i>Elymus virginicus</i>	Virginia wild rye	12.00
<i>Glyceria striata</i>	Fowl manna grass	4.00
<i>Helenium autumnale</i>	Sneezeweed	1.50
<i>Leersia oryzoides</i>	Rice cut grass	2.00
<i>Lobelia silphilitica</i>	Great blue lobelia	1.50
<i>Mimulus ringens</i>	Monkeyflower	1.75
<i>Panicum virgatum</i>	Switch grass	2.50
<i>Rudbeckia laciniata</i>	Wild golden glow	0.75
<i>Scirpus atrovirens</i>	Dark green rush	6.00
<i>Spartina pectinata</i>	Prairie cord grass	4.00
<i>Verbesina alternifolia</i>	Wingstem	1.00
TOTAL NATIVE FORBS AND GRASSES		70.50 = (4.41 lbs/acre)

Temporary Cover Component

<u>Scientific Name</u>	<u>Common Name</u>	<u>Ounces/Acre</u>
<i>Agrostis gigantea</i>	Redtop	16.00
<i>Elymus hystrix</i>	Eastern bottlebrush grass	64.00
<i>Lolium multiflorum</i>	Annual rye	400.00
TOTAL		480.00 = (30.00 lbs/acre)

Native Trees and Shrubs

<u>Scientific Name</u>	<u>Common Name</u>	<u>Quantity</u>
<i>Acer saccharinum</i>	Silver maple	25
<i>Betula nigra</i>	River birch	25
<i>Fraxinus pennsylvanica</i>	Green ash	50
<i>Quercus palustris</i>	Pin oak	25
TOTAL TREES		125

DRAINAGE CHANNEL SIDESLOPE IMPACT AREA (0.03 acre)

Slope Stabilization Mix (36.00 pounds/acre)

Native Component

<u>Scientific Name</u>	<u>Common Name</u>	<u>Ounces/Acre</u>
<i>Andropogon gerardii</i>	Big bluestem	20.00
<i>Bouteloua curtipendula</i>	Side-oats grama	3.00
<i>Elymus canadensis</i>	Canada wild-rye	5.00
<i>Panicum virgatum</i>	Switch grass	12.00
<i>Schizachyrium scoparium</i>	Little bluestem	32.00
<i>Sorghastrum nutans</i>	Indian grass	<u>24.00</u>
TOTAL NATIVE GRASSES		96.00 = (6.00 lbs/acre)

Temporary Cover Component

<u>Scientific Name</u>	<u>Common Name</u>	<u>Ounces/Acre</u>
<i>Agrostis gigantea</i>	Redtop	16.00
<i>Elymus hystrix</i>	Eastern bottlebrush grass	64.00
<i>Lolium perenne</i>	Annual rye	<u>400.00</u>
TOTAL		480.00 = (30.00 lbs/acre)

Native Trees and Shrubs

<u>Scientific Name</u>	<u>Common Name</u>	<u>Quantity</u>
<i>Cornus amomum</i>	Silky dogwood	50
<i>Salix discolor</i>	Pussy willow	<u>50</u>
TOTAL TREES		100

TRANSITION ZONE IMPACT AREA (0.18 acre)

Slope Stabilization Mix (36.00 pounds/acre)

Native Component		
<u>Scientific Name</u>	<u>Common Name</u>	<u>Ounces/Acre</u>
<i>Andropogon gerardii</i>	Big bluestem	20.00
<i>Bouteloua curtipendula</i>	Side-oats grama	3.00
<i>Elymus canadensis</i>	Canada wild-rye	5.00
<i>Panicum virgatum</i>	Switch grass	12.00
<i>Schizachyrium scoparium</i>	Little bluestem	32.00
<i>Sorghastrum nutans</i>	Indian grass	<u>24.00</u>
TOTAL NATIVE GRASSES		96.00 = (6.00 lbs/acre)

Temporary Cover Component		
<u>Scientific Name</u>	<u>Common Name</u>	<u>Ounces/Acre</u>
<i>Agrostis gigantea</i>	Redtop	16.00
<i>Elymus hystrix</i>	Eastern bottlebrush grass	64.00
<i>Lolium perenne</i>	Annual rye	<u>400.00</u>
TOTAL		480.00 = (30.00 lbs/acre)

Native Trees and Shrubs

<u>Scientific Name</u>	<u>Common Name</u>	<u>Quantity</u>
<i>Acer saccharum</i>	Sugar maple	25
<i>Juglans nigra</i>	Black walnut	25
<i>Liriodendron tulipifera</i>	Tulip tree	50
<i>Quercus rubra</i>	Red oak	<u>50</u>
TOTAL TREES		150

Appendix B: Wetland Data Sheets

DATA ENTRY FORM					
MITIGATION WETLAND MONITORING					
Special Site Notes: None					
Project Number: 040229			Project Name/Location: RMT/New Jersey		
General Site Conditions: Moist soil surface			Date: September 20, 2007		
Past and Present Weather: Sunny, dry			Hydrology: Soil moist to saturated		
Wildlife:					
VEGETATION SAMPLING DATA					
Transect 1: Transition Zone					
Plot Number	Species Names	Cover	Plot Number	Species Names	Cover
Plot 1	<i>Eupatorium rugosum</i>	5%	Plot 3	<i>Gnaphalium obtusum</i>	2%
	<i>Euthamia graminifolia</i>	25%		<i>Erechtites hieracifolia</i>	2%
	<i>Solidago altissima</i>	10%		<i>Chrysanthemum leucanthemum</i>	2%
	<i>Agrostis gigantea</i>	40%		<i>Andropogon gerardii</i>	2%
	<i>Acalypha rhomboidea</i>	3%		<i>Eleusine indica</i>	80%
	<i>Setaria glauca</i>	2%		<i>Bidens discoidea</i>	1%
	<i>Oxalis stricta</i>	1%		<i>Acalypha rhomboidea</i>	1%
	<i>Artemisia vulgaris</i>	2%		<i>Conyza canadensis</i>	1%
	<i>Cyperus strigosus</i>	1%		<i>Eupatorium maculatum</i>	10%
	<i>Aster lanceolatus</i>	3%		<i>Trifolium repens</i>	1%
	<i>Medicago lupulina</i>	2%		<i>Potentilla simplex</i>	1%
	<i>Lobelia siphilitica</i>	1%			
	<i>Chrysanthemum leucanthemum</i>	2%	Plot 4	<i>Catalpa speciosa</i>	1%
	<i>Coronilla varia</i>	3%		<i>Polygonum persicaria</i>	2%
	<i>Bidens frondosus</i>	1%		<i>Mellilotus sp.</i>	5%
	<i>Trifolium repens</i>	2%		<i>Acalypha rhomboidea</i>	3%
	<i>Eleusine indica</i>	7%		<i>Lobelia inflata</i>	1%
	<i>Echinocloa crusgalli</i>	100%		<i>Lythrum salicaria</i>	3%
<i>Lythrum salicaria</i>	1%	<i>Trifolium repens</i>		5%	
		<i>Euthamia graminifolia</i>		10%	
		<i>Eleusine indica</i>		30%	
		<i>Medicago lupulina</i>		3%	
		<i>Plantago major</i>		2%	
		<i>Ambrosia artemisiifolia</i>		5%	
Plot 2	<i>Sorghastrum nutans</i>	5%	<i>Agrostis hyemalis</i>	25%	
	<i>Chrysanthemum leucanthemum</i>	13%	<i>Setaria glauca</i>	1%	
	<i>Eleusine indica</i>	25%	<i>Eupatorium maculatum</i>	3%	
	<i>Acalypha rhomboidea</i>	5%	<i>Conyza canadensis</i>	1%	
	<i>Lespedeza capitata</i>	2%	<i>Solidago rugosa</i>	2%	
	<i>Potentilla simplex</i>	5%	<i>Panicum dichotomiflorum</i>	2%	
	<i>Trifolium repens</i>	5%			
	<i>Panicum dichotomiflorum</i>	2%			
	<i>Conyza canadensis</i>	2%			
	<i>Echinocloa crusgalli</i>	2%			
	<i>Polygonum pensylvanicum</i>	1%			
	<i>Agrostis hyemalis</i>	35%			

VEGETATION SAMPLING DATA									
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Transect 1: Transition Zone	
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VEGETATION SAMPLING DATA	
Transition Zone Inventory	
<i>Acalypha rhomboidea</i>	<i>Lamium purpureum</i>
<i>Agrostis gigantea</i>	<i>Lespedeza capitata</i>
<i>Agrostis hyemalis</i>	<i>Lobelia inflata</i>
<i>Ambrosia artemisiifolia</i>	<i>Lobelia siphilitica</i>
<i>Andropogon gerardii</i>	<i>Lythrum salicaria</i>
<i>Andropogon scoparius</i>	<i>Medicago lupulina</i>
<i>Apocynum cannabinum</i>	<i>Oxalis stricta</i>
<i>Artemisia vulgaris</i>	<i>Panicum dichotomiflorum</i>
<i>Aster lanceolatus</i>	<i>Panicum virgatum</i>
<i>Bidens cernuus</i>	<i>Plantago lanceolata</i>
<i>Bidens frondosus</i>	<i>Plantago major</i>
<i>Bouteloua curtipendula</i>	<i>Polygonum lapathifolium</i>
<i>Cassia hebecarpa</i>	<i>Polygonum pensylvanicum</i>
<i>Catalpa speciosa</i>	<i>Polygonum persicaria</i>
<i>Celastrus orbiculatus</i>	<i>Populus deltoides</i>
<i>Centaurea maculosa</i>	<i>Potentilla simplex</i>
<i>Chrysanthemum leucanthemum</i>	<i>Rubus allegheniensis</i>
<i>Cirsium vulgare</i>	<i>Rumex crispus</i>
<i>Conyza canadensis</i>	<i>Setaria faberi</i>
<i>Coronilla varia</i>	<i>Setaria glauca</i>
<i>Cyperus strigosus</i>	<i>Solidago altissima</i>
<i>Echinocloa crusgalli</i>	<i>Solidago rugosa</i>
<i>Elaeagnus angustifolia</i>	<i>Sorghastrum nutans</i>
<i>Eleusine indica</i>	<i>Toxicodendron radicans</i>
<i>Elymus canadensis</i>	<i>Trifolium pratense</i>
<i>Eragrostis pectinacea</i>	<i>Trifolium repens</i>
<i>Erechtites hieracifolia</i>	<i>Verbascum thapsus</i>
<i>Erigeron strigosus</i>	<i>Verbena urticifolia</i>
<i>Eupatorium rugosum</i>	<i>Vitis labrusca</i>
<i>Euphorbia maculata</i>	
<i>Euthamia graminifolia</i>	
<i>Gnaphalium obtusifolium</i>	
<i>Helenium autumnale</i>	
<i>Hypericum perforatum</i>	
<i>Juncus effusus</i>	

VEGETATION SAMPLING DATA					
Transect 2: Emergent Wetland Zone					
Plot Number	Species Names	Cover	Plot Number	Species Names	Cover
Plot 1	<i>Epilobium coloratum</i>	3%	Plot 4	<i>Apocynum cannabinum</i>	2%
	<i>Polygonum sagittatum</i>	25%		<i>Solidago altissima</i>	6%
	<i>Typha latifolia</i>	10%		<i>Echinocloa crusgalli</i>	2%
	<i>Euthamia graminifolia</i>	10%		<i>Eupatorium maculatum</i>	3%
	<i>Solidago gigantea</i>	15%		<i>Lythrum salicaria</i>	5%
	<i>Pilea pumila</i>	5%		<i>Euthamia graminifolia</i>	10%
	<i>Impatiens capensis</i>	5%		<i>Polygonum persicaria</i>	1%
	<i>Toxicodendron radicans</i>	5%		<i>Agalinis tenuifolia</i>	2%
	<i>Phalaris arundinacea</i>	15%		Bare ground	70%
	<i>Agrostis hyemalis</i>	10%			
	<i>Lythrum salicaria</i>	5%	Plot 5	<i>Lythrum salicaria</i>	15%
				<i>Setaria glauca</i>	10%
Plot 2	<i>Phalaris arundinacea</i>	2%		<i>Echinocloa crusgalli</i>	10%
	<i>Agrostis hyemalis</i>	80%		<i>Verbena urticifolia</i>	3%
	<i>Polygonum sagittatum</i>	15%		<i>Erechtites hieracifolia</i>	3%
	<i>Euthamia graminifolia</i>	10%		<i>Solidago rugosa</i>	4%
	<i>Impatiens capensis</i>	1%		<i>Agrostis gigantea</i>	5%
	<i>Toxicodendron radicans</i>	1%		<i>Cyperus strigosus</i>	2%
	<i>Parthenocissus quinquefolia</i>	1%		<i>Geum canadense</i>	1%
	<i>Cirsium arvense</i>	1%		<i>Potentilla simplex</i>	1%
	<i>Lythrum salicaria</i>	2%		<i>Acalypha rhomboidea</i>	2%
				<i>Agrostis hyemalis</i>	5%
Plot 3	<i>Juncus effusus</i>	7%		<i>Plantago major</i>	4%
	<i>Cyperus strigosus</i>	8%		<i>Desmodium ciliare</i>	2%
	<i>Solidago gigantea</i>	8%		<i>Solidago gigantea</i>	5%
	<i>Erechtites hieracifolia</i>	2%		<i>Euthamia graminifolia</i>	5%
	<i>Polygonum persicaria</i>	1%		<i>Medicago lupulina</i>	3%
	<i>Solidago altissima</i>	5%		Bare ground	25%
	<i>Euthamia graminifolia</i>	4%			
	<i>Lythrum salicaria</i>	10%	Plot 6	<i>Setaria glauca</i>	5%
	<i>Echinocloa crusgalli</i>	15%		<i>Plantago major</i>	25%
	<i>Trifolium repens</i>	3%		<i>Agrostis gigantea</i>	25%
	<i>Rosa palustris</i>	1%		<i>Echinocloa crusgalli</i>	3%
	<i>Epilobium coloratum</i>	2%		<i>Daucus carota</i>	5%
	<i>Pilea pumila</i>	1%		<i>Bidens frondosa</i>	2%
	<i>Panicum dichotomiflorum</i>	2%		<i>Trifolium repens</i>	5%
	<i>Agrostis hyemalis</i>	7%		<i>Acalypha rhomboidea</i>	3%
	<i>Daucus carota</i>	3%		<i>Eupatorium maculatum</i>	2%
				<i>Eleusine indica</i>	15%
				Bare ground	10%

VEGETATION SAMPLING DATA	
Emergent Wetland Zone Inventory	
Hydrology: Soil moist at surface.	
Species Names	Species Names
<i>Acalypha rhomboidea</i>	<i>Panicum dichotomiflorum</i>
<i>Agalinis tenuifolia</i>	<i>Parthenocissus quinquefolia</i>
<i>Agrostis gigantea</i>	<i>Phalaris arundinacea</i>
<i>Agrostis hyemalis</i>	<i>Pilea pumila</i>
<i>Apocynum cannabinum</i>	<i>Plantago major</i>
<i>Arisaema triphyllum</i>	<i>Polygonum pensylvanicum</i>
<i>Bidens frondosus</i>	<i>Polygonum persicaria</i>
<i>Boehmeria cylindrica</i>	<i>Polygonum punctatum</i>
<i>Carex crinita</i>	<i>Polygonum sagittatum</i>
<i>Carex hystericina</i>	<i>Polygonum virginianum</i>
<i>Chrysanthemum leucanthemum</i>	<i>Potentilla simplex</i>
<i>Cirsium arvense</i>	<i>Rosa palustris</i>
<i>Cirsium discolor</i>	<i>Scirpus validus</i>
<i>Cornus amomum</i>	<i>Setaria glauca</i>
<i>Cyperus strigosus</i>	<i>Solidago altissima</i>
<i>Daucus carota</i>	<i>Solidago gigantea</i>
<i>Desmodium ciliare</i>	<i>Toxicodendron radicans</i>
<i>Echinocloa crusgalli</i>	<i>Trifolium repens</i>
<i>Eleocharis erythropoda</i>	<i>Typha latifolia</i>
<i>Eleusine indica</i>	<i>Ulmus rubra</i>
<i>Epilobium coloratum</i>	<i>Verbena hastata</i>
<i>Erechtites hieracifolia</i>	<i>Verbena urticifolia</i>
<i>Euphorbia maculata</i>	
<i>Euthamia graminifolia</i>	
<i>Fraxinus pennsylvanica</i>	
<i>Geum canadense</i>	
<i>Helenium autumnale</i>	
<i>Impatiens capensis</i>	
<i>Juncus effusus</i>	
<i>Leersia oryzoides</i>	
<i>Lemna minor</i>	
<i>Lobelia siphilitica</i>	
<i>Ludwigia palustris</i>	
<i>Lythrum salicaria</i>	
<i>Medicago lupulina</i>	

VEGETATION SAMPLING DATA					
Transect 3: Forested Wetland Zone					
Plot Number	Species Names	Cover	Plot Number	Species Names	Cover
Plot 1	<i>Typha latifolia</i>	2%	Plot 4	<i>Pilea pumila</i>	2%
	<i>Leersia oryzoides</i>	5%		<i>Setaria glauca</i>	5%
	<i>Bidens cernua</i>	2%		<i>Eupatorium maculatum</i>	2%
	<i>Echinocloa crusgalli</i>	3%			
	<i>Cyperus esculentus</i>	1%		<i>Rumex crispus</i>	2%
	<i>Panicum dichotomiflorum</i>	1%		<i>Erechtites hieracifolia</i>	3%
	<i>Verbena hastata</i>	1%		<i>Bidens frondosa</i>	2%
	Bare ground	85%		<i>Plantago major</i>	10%
Plot 2			Plot 5	<i>Lythrum salicaria</i>	5%
	<i>Acalypha rhomboidea</i>	5%		<i>Trifolium repens</i>	5%
	<i>Helenium autumnale</i>	30%		<i>Verbena hastata</i>	1%
	<i>Cirsium arvense</i>	5%		<i>Acalypha rhomboidea</i>	10%
	<i>Euthamia graminifolia</i>	3%		<i>Populus deltoides</i>	2%
	<i>Setaria glauca</i>	3%		<i>Aster umbellatus</i>	3%
	<i>Agrostis hyemalis</i>	7%		<i>Bidens discoidea</i>	1%
	<i>Echinocloa crusgalli</i>	15%		<i>Conyza canadensis</i>	1%
	<i>Solidago rugosa</i>	8%		<i>Solidago altissima</i>	3%
	<i>Lythrum salicaria</i>	8%		<i>Euthamia graminifolia</i>	5%
	<i>Eupatorium rugosum</i>	3%		<i>Echinocloa crusgalli</i>	5%
	<i>Cyperus esculentus</i>	5%		<i>Panicum dichotomiflorum</i>	20%
	<i>Agrostis gigantea</i>	2%		<i>Agrostis hyemalis</i>	10%
	<i>Panicum capillare</i>	2%		<i>Helenium autumnale</i>	5%
	<i>Polygonum punctatum</i>	1%		<i>Potentilla simplex</i>	3%
	<i>Pilea pumila</i>	3%		<i>Agrostis gigantea</i>	3%
	<i>Erechtites hieracifolia</i>	2%		Bare ground	5%
Plot 3					
	<i>Agrostis hyemalis</i>	30%	Plot 5	<i>Helenium autumnale</i>	40%
	<i>Eleusine indica</i>	10%		<i>Eleusine indica</i>	15%
	<i>Echinocloa crusgalli</i>	7%		<i>Polygonum persicaria</i>	2%
	<i>Artemisia vulgaris</i>	3%		<i>Ambrosia artemisiifolia</i>	2%
	<i>Lythrum salicaria</i>	7%		<i>Elaeagnus angustifolia</i>	4%
	<i>Plantago major</i>	20%		<i>Lythrum salicaria</i>	3%
	<i>Erechtites hieracifolia</i>	3%		<i>Lobelia siphilitica</i>	2%
	<i>Panicum dichotomiflorum</i>	2%		<i>Setaria glauca</i>	2%
	<i>Solidago altissima</i>	2%		<i>Panicum dichotomiflorum</i>	5%
	<i>Potentilla simplex</i>	1%		<i>Solidago altissima</i>	3%
	<i>Daucus carota</i>	1%		<i>Acalypha rhomboidea</i>	7%
	<i>Verbena hastata</i>	1%		<i>Melilotus</i> sp.	7%
	<i>Chrysanthemum leucanthemum</i>	1%		<i>Agrostis gigantea</i>	2%
	<i>Polygonum punctatum</i>	1%		<i>Solidago rugosa</i>	2%
	<i>Trifolium repens</i>	5%		<i>Daucus carota</i>	1%
	<i>Acalypha rhomboidea</i>	3%		<i>Agrostis hyemalis</i>	20%
	<i>Oxalis stricta</i>	2%		Bare ground	10%

VEGETATION SAMPLING DATA

Transect 3: Forested Wetland Zone

[illegible]

VEGETATION SAMPLING DATA	
Forested Wetland Zone Inventory	
Hydrology: Soil moist to saturated at surface.	
Species Names	Species Names
<i>Acalypha rhomboidea</i>	<i>Lamium purpureum</i>
<i>Agrostis gigantea</i>	<i>Lespedeza capitata</i>
<i>Agrostis hyemalis</i>	<i>Lobelia inflata</i>
<i>Ambrosia artemisiifolia</i>	<i>Lobelia siphilitica</i>
<i>Andropogon gerardii</i>	<i>Lythrum salicaria</i>
<i>Andropogon scoparius</i>	<i>Medicago lupulina</i>
<i>Apocynum cannabinum</i>	<i>Oxalis stricta</i>
<i>Artemisia vulgaris</i>	<i>Panicum dichotomiflorum</i>
<i>Aster lanceolatus</i>	<i>Panicum virgatum</i>
<i>Bidens cernuus</i>	<i>Plantago lanceolata</i>
<i>Bidens frondosus</i>	<i>Plantago major</i>
<i>Bouteloua curtipendula</i>	<i>Polygonum lapathifolium</i>
<i>Cassia hebecarpa</i>	<i>Polygonum pennsylvanicum</i>
<i>Catalpa speciosa</i>	<i>Polygonum persicaria</i>
<i>Celastrus orbiculata</i>	<i>Populus deltoides</i>
<i>Centaurea maculosa</i>	<i>Potentilla simplex</i>
<i>Chrysanthemum leucanthemum</i>	<i>Rubus allegheniensis</i>
<i>Cirsium vulgare</i>	<i>Rumex crispus</i>
<i>Conyza canadensis</i>	<i>Setaria faberi</i>
<i>Coronilla varia</i>	<i>Setaria glauca</i>
<i>Cyperus strigosus</i>	<i>Solidago altissima</i>
<i>Echinocloa crusgalli</i>	<i>Solidago rugosa</i>
<i>Elaeagnus angustifolia</i>	<i>Sorghastrum nutans</i>
<i>Eleusine indica</i>	<i>Toxicodendron radicans</i>
<i>Elymus canadensis</i>	<i>Trifolium pratense</i>
<i>Eragrostis pectinacea</i>	<i>Trifolium repens</i>
<i>Erechtites hieracifolia</i>	<i>Verbascum thapsus</i>
<i>Erigeron strigosus</i>	<i>Vitis labrusca</i>
<i>Eupatorium rugosum</i>	
<i>Euphorbia maculata</i>	
<i>Euthamia graminifolia</i>	
<i>Gnaphalium obtusifolium</i>	
<i>Helenium autumnale</i>	
<i>Hypericum perforatum</i>	
<i>Juncus effusus</i>	

Appendix C: Photographs of Wetland Development



Photo 1. Panoramic view near Photostation 3, facing southeast (May 15, 2007)



Photo 2. Panoramic view near Photostation 3, facing southeast (September 20, 2007)

**Site Photographs
May 15 and September 20, 2007
L.E. Carpenter & Company
Wetland Restoration Area
Wharton, Morris County, New Jersey**

JFNew # 040229



11181 Marwill Avenue; West Olive, MI 49460
Phone 616-847-1680 / Fax 616-847-9970
www.jfnew.com



Photo 3. Panoramic view at Photostation 2, facing northeast (May 15, 2007)



Photo 4. Panoramic view at Photostation 2, facing northeast (September 20, 2007)

Site Photographs
May 15 and September 20, 2007
L.E. Carpenter & Company
Wetland Restoration Area
Wharton, Morris County, New Jersey

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Photo 5. Panoramic view facing southwest from east end of Emergent Zone transect (May 15, 2007)



Photo 6. Panoramic view facing southwest from east end of mitigation wetland (September 20, 2007)

Site Photographs
May 15 and September 20, 2007
L.E. Carpenter & Company
Wetland Restoration Area
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Photo 7. View facing east towards isolated transition zone. (May 15, 2007)



Photo 8. View facing east towards isolated transition zone. (September 20, 2007)

Site Photographs
May 15 and September 20, 2007
L.E. Carpenter & Company
Wetland Restoration Area
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**Photo 9. View facing south of low depressional area in emergent/forested wetland zone.
(May 15, 2007)**



Photo 10. View facing southwest of low depressional area in emergent/forested wetland zone.

Site Photographs
May 15 and September 20, 2007
L.E. Carpenter & Company
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Wharton, Morris County, New Jersey

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Appendix D:

NJDEP Permit 1439-04-0001.1



State of New Jersey

Department of Environmental Protection

Bradley M. Campbell
Commissioner

Richard J. Codey
Acting Governor

Land Use Regulation Program
P.O. Box 439, Trenton, NJ 08625-0439
Fax # (609) 292-8115
www.state.nj.us/dcp/landuse

FEB 25 2005

Mr. Nicholas Clevett
RMT, Inc., Michigan
2025 E. Beltline Avenue SE, Suite 402
Grand Rapids, MI 49546

RE: Authorization for Freshwater Wetlands Statewide General Permit No. 4

File No.: 1439-04-0001.1 (FWW 040001)

Applicant: L.E. Carpenter & Company

Block: 301; Lot: 1

Block: 801; Lots: 3, 4, & 5

Wharton Borough, Morris County

Nearest Waterway: Rockaway River

Passaic River Basin

Dear Mr. Clevett:

The Land Use Regulation Program has reviewed the referenced application for a Statewide General Permit authorization pursuant to the requirements of the Freshwater Wetlands Protection Act Rules at N.J.A.C. 7:7A. The proposed activity is authorized by Statewide General Permit No. 4, which allows regulated activities in freshwater wetlands, transition areas and State open waters for the investigation, cleanup or removal of hazardous substances or pollutants, which are undertaken, authorized or otherwise expressly approved in writing by the Department of Environmental Protection (Department).

Limit of Authorized Disturbance

The approved plans are prepared by RMT, Inc., dated February 21, 2005, last revised February 21, 2005, and entitled:

"L.E. Carpenter, Wetland and Stream Encroachment Permit Applications, Wharton, New Jersey"

"F3 - Wetland Impact Map", Sheet No. F3 of 7;

"F4 - Wetland Restoration Plan", Sheet No. F4 of 7;

"F5 - Construction Staging and Excavation Plan", Sheet No. F5 of 7;

"F6 - Final Grading Plan", Sheet No. F6 of 7;

"F7 - Details", Sheet No. F7 of 7

Statewide General Permit
File No.: 1439-04-0001.1

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Based on the approved plans, the authorized activity involves the disturbance of approximately 0.42 of an acre of freshwater wetlands and/or State open waters and approximately 0.19 acres of wetland transition areas for removal of contaminated soil and restoration of the disturbed areas. Any additional disturbance of freshwater wetlands, State open waters or transition areas besides that shown on the approved plans shall be considered a violation of the Freshwater Wetlands Protection Act unless the activity is exempt or a permit is obtained prior to the start of the disturbance from the Land Use Regulation Program.

Permit Conditions

The activities allowed by this authorization shall comply with the following conditions. Failure to comply with these conditions shall constitute a violation of the Freshwater Wetlands Protection Act (N.J.S.A. 13:9B-1 et seq.).

Special Conditions

1. All regulated activities at this existing Superfund site must be in accordance with the requirements of the Department's Site Remediation Program and the United States Environmental Protection Agency, including any requirements contained within an approved Remedial Action Workplan.
2. In order to protect the trout maintenance and trout stocked waters of the Rockaway River, any proposed grading or construction activities within the banks of this river are prohibited between March 15 and June 15 of each year. In addition, any activity within the 100-year flood plain or flood hazard area of this watercourse which could introduce sediment into said stream or which could cause an increase in the natural level of turbidity is also prohibited during this period. The Department reserves the right to suspend all regulated activities on site should it be determined that the applicant has not taken proper precautions to ensure continuous compliance with this condition.
3. All backfill soils shall consist of clean, suitable material free from toxic pollutants in toxic amounts.
4. In addition to restoration of the wetland transition area as shown on the approved plan entitled "F4- Wetland Restoration Plan", the applicant shall also restore an area of wetland transition area not currently shown on the plan. This area extends 50' from the wetlands on the Wharton Enterprise property. These wetlands are classified as Intermediate resource value. This additional wetland transition area is drawn on the attached map portion. The restoration of this additional area shall be consistent with the notes on Sheet No. F4 of 7.
5. The mitigation project must be conducted prior to or concurrent with the construction of the approved project.

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6. Mitigate for the loss of 0.16 acres of emergent wetlands and 0.26 acres of forested and scrub/shrub wetlands through an on-site restoration project as shown on the plan entitled "F4 - Wetland Restoration Plan, L.E. Carpenter, Wetland and Stream Encroachment Permit Applications, Wharton, New Jersey", dated February 21, 2005, last revised February 21, 2005, and prepared by RMT, Inc. In the event there is a conflict between the permit conditions and the approved mitigation plan and proposal the permit conditions take precedent.
7. The permittee shall notify the Land Use Regulation Program, in writing, at least thirty (30) days in advance of the start of construction of the wetland mitigation project for an on-site pre-construction meeting between the permittee, the contractor, the consultant and the Program.
8. The mitigation designer must be present during critical stages of construction of the mitigation project this includes but is not limited to herbicide applications, sub-grade inspection, final grade inspection, and planting inspection to ensure the intent of the mitigation design and their predicted wetland hydrology is realized in the landscape. Mitigation designs are not static documents and changes may be necessary to ensure success of the project. It shall be the prerogative of the mitigation consultant to make changes to the design should field conditions warrant such action.
9. Immediately following final grading of the site, a disc must be run over the site to eliminate compaction. The mitigation designer must be present to oversee this phase of the project and confirm with the Department this activity has occurred prior to planting of the site.
10. Immediately following the final grading of the mitigation site and prior to planting, the permittee shall notify the Program for a post-grading construction meeting between the permittee, contractor, consultant and the Program. The permittee must give the Program at least thirty (30) days notice prior to the date of this meeting.
11. Within 30 days following the final grading and planting of the mitigation project, the permittee shall submit a final report to the Land Use Regulation Program. The final report shall contain, at a minimum, the following information:
 - a. A completed WETLAND MITIGATION PROJECT COMPLETION OF CONSTRUCTION FORM (attached) which certifies that the mitigation project has been constructed as designed and that the proposed area of wetland creation, restoration or enhancement has been accomplished;
 - b. As built plans which depict final grade elevations at one foot contours and include a table of the species and quantities of vegetation that were planted including any grasses that may have been used for soil stabilization purposes;
 - c. Show on the as-built plans that the boundaries of the wetland mitigation area has been visibly marked with 3 inch white PVC pipe extending 4 feet above the ground surface. The stakes must remain on the site for the entire monitoring period;

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- d. Photos of the constructed wetland mitigation project with a photo location map as well as the GPS waypoints in NJ state plane coordinates NAD 1983;
 - e. To document that the required amount of soil has been placed/replaced over the entire area of the mitigation site, provide a minimum of 6 soil profile descriptions to a depth of 20 inches. The location of each soil profile description should be depicted on the as built plan as well as provide the GPS waypoints in NJ state plane coordinates NAD 1983;
 - f. Submit soil test results demonstrating at least 8% organic carbon content (by weight) was incorporated into the A-horizon for sandy soil and for all other soil types 12% organic content or if manmade top soil was used it consisted of equal volumes of organic and mineral materials;
 - g. The permittee shall post the mitigation area with several permanent signs, which identify the site as a wetland mitigation project and that mowing, cutting, dumping and draining of the property is prohibited; and
 - h. The sign must also state the name of the permittee, LURP permit number along with a contact name and phone number.
12. If the Program determines that the mitigation project is not constructed in conformance with the approved plan, the permittee will be notified in writing and will have 60 days to submit a proposal to indicate how the project will be corrected. No financial surety will be released by the Program until the permittee demonstrates that the mitigation project is constructed in conformance with the approved plan, all soil has been stabilized and there is no active erosion.
13. The permittee shall monitor the mitigation project for 5 full growing seasons if it is a proposed forested or scrub/shrub wetland and 3 full growing seasons for an emergent wetland or State open water after the mitigation project has been constructed. The permittee shall submit monitoring reports to the Land Use Regulation Program no later than December 31st of each monitoring year (All monitoring reports must include the standard items identified in the attachment and the information requested below).
14. All monitoring report will include all the following information (see attached monitoring report checklist):
- a. All monitoring reports except the final one must include documentation that it is anticipated, based on field data, that the goals of the wetland mitigation project including the transition area, as stated in the approved wetland mitigation proposal and the permit will be satisfied. If the permittee is finding problems with the mitigation project and does not anticipate the site will be a full success then recommendations on how to rectify the problems must be included in the report with a time frame in which they will be completed;
 - b. All monitoring reports except the final one must include field data to document that the site is progressing towards 85 percent survival and 85 percent area coverage of mitigation plantings or target hydrophytes (Target hydrophytes are non-invasive native species to the area and similar to ones identified on the mitigation planting plan). If the proposed plant community is a scrub/shrub or a forested wetland the permittee must also demonstrate each year with data that the woody species are thriving, increasing in stem density and height each year. If the field data shows that the mitigation project is failing to meet the vegetation survival, coverage and health goals, the monitoring

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report should contain a discussion of steps that will be taken to rectify the problem, including a schedule of implementation;

- c. All monitoring reports except the final one must include documentation of any invasive or noxious species (see below for list of species) colonizing the site and how they are being eliminated. The permittee is required to eliminate either through hand-pulling, application of a pesticide or other Department approved method any occurrence of an invasive/noxious species on the mitigation site during the monitoring period;
 - d. All monitoring reports except the final one must include documentation that demonstrates the proposed hydrologic regime as specified in the mitigation proposal appears to be met. If the permittee is finding problems with the mitigation project and does not anticipate the proposed hydrologic regime will be or has not been met then recommendations on how to rectify the problem must be included in the report along with a time frame within which it will be completed;
 - e. The final monitoring report must include documentation to demonstrate that the goals of the wetland mitigation project including the required transition area, as stated in the approved wetland mitigation proposal and the permit, has been satisfied. Documentation for this report will also include a field wetland delineation of the wetland mitigation project based on techniques as specified in the Federal Manual for Identifying and Delineating Jurisdictional Wetlands (1989);
 - f. The final monitoring report must include documentation the site has an 85 percent survival and 85 percent area coverage of the mitigation plantings or target hydrophytes. The permittee must also document that all plant species are healthy and thriving and if the proposed plant community contains trees demonstrate that the trees are at least five feet in height;
 - g. The final monitoring report must include documentation demonstrating the site is less than 10 percent occupied by invasive or noxious species such as but not limited to *Phalaris arundinacea* (Reed canary grass), *Phragmites australis* (Common reed grass), *Pueraria lobata* (Kudzu), *Typha latifolia* (Broad-leaved cattail), *Typha angustifolia* (Narrowed leaved cattail), *Lythrum salicaria* (Purple loosestrife), *Ailanthus altissima* (Tree-of-heaven), *Berberis thunbergii* (Japanese barberry), *Berberis vulgaris* (Common barberry), *Elaeagnus angustifolia* (Russian olive), *Elaeagnus umbellata* (Autumn olive), *Ligustrum obtusifolium* (Japanese privet), *Ligustrum vulgare* (Common privet) and *Rosa multiflora* (Multiflora rose);
 - h. The final monitoring report must include documentation that demonstrates that the proposed hydrologic regime as specified in the mitigation proposal, which proves the mitigation site is a wetland has been satisfied. The documentation shall include when appropriate monitoring well data, stream gauge data, photographs and field observation notes collected throughout the monitoring period; and
 - i. The final monitoring report must include documentation that the site contains hydric soils or there is evidence of reduction occurring in the soil throughout the delineated wetlands.
15. Once the required monitoring period has expired and the permittee has submitted the final monitoring report, the Program will make the finding that the mitigation project is either a

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success or a failure. This mitigation project will be considered successful if the permittee demonstrates all of the following:

- a. That the goals of the wetland mitigation project including acreage and the required transition area, as stated in the approved wetland mitigation proposal and the permit, has been satisfied. The permittee must submit a field wetland delineation of the wetland mitigation project based on the Federal Manual for Identifying and Delineating Jurisdictional Wetlands (1989) which shows the exact acreage of State open waters, emergent, scrub/shrub and/or forested wetlands in the mitigation area;
 - b. The site has an 85 percent survival and 85 percent area coverage of the mitigation plantings or target hydrophytes which are species native to the area and similar to ones identified on the mitigation planting plan. All plant species in the mitigation area are healthy and thriving. All trees are at least five feet in height;
 - c. The site is less than 10 percent occupied by invasive or noxious species such as but not limited to *Phalaris arundinacea* (Reed canary grass), *Phragmites australis* (Common reed grass), *Pueraria montana* (Kudzu), *Typha latifolia* (Broad-leaved cattail), *Typha angustifolia* (Narrowed leaved cattail), *Lythrum salicaria* (Purple loosestrife), *Ailanthus altissima* (Tree-of-heaven), *Berberis thunbergi* (Japanese barberry), *Berberis vulgaris* (Common barberry), *Elaeagnus angustifolia* (Russian olive), *Elaeagnus umbellata* (Autumn olive), *Ligustrum obtusifolium* (Japanese privet), *Ligustrum vulgare* (Common privet) and *Rosa multiflora* (Multiflora rose);
 - d. The site contains hydric soils or there is evidence of reduction occurring in the soil; and,
 - e. The proposed hydrologic regime as specified in the mitigation proposal, which proves the mitigation site is a wetland has been satisfied.
16. If the mitigation project is considered a failure, the permittee is required to submit a revised mitigation plan to rectify the wetland mitigation site. The plan shall be submitted within 60 days of receipt of the letter from the Program indicating the wetland mitigation project was a failure.
17. The permittee shall assume all liability for accomplishing corrective work should the Program determine that the compensatory mitigation has not been 100% satisfactory. Remedial work may include re-grading and/or replanting the mitigation site. This responsibility is incumbent upon the permittee until such time that the Department makes the finding that the mitigation project is successful.

In addition to the above conditions and the conditions noted at N.J.A.C. 7:7A 4.3 and 5.4, the following general conditions must be met for the activity authorized under this Statewide General Permit:

General Conditions:

18. All fill and other earth work on the lands encompassed within this permit authorization shall be stabilized in accordance with "Standards for Soil Erosion and Sediment Control in New Jersey" to prevent eroded soil from entering adjacent waterways or wetlands at any time during and subsequent to construction.

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19. This permit is revocable in accordance with DEP regulations and State law.
20. The issuance of this permit shall not be deemed to affect in any way other actions by the Department on any future application.
21. The activities shown on the approved plans shall be constructed and/or executed in conformity with any notes and details on said plans and any conditions stipulated herein.
22. No change in plans or specifications shall be made except with the prior written permission of the Department.
23. The granting of this authorization shall not be construed to in any way affect the title or ownership of the property, and shall not make the Department or the State a party in any suit or question of ownership of the property.
24. This permit is not valid and no work shall be undertaken pursuant to this authorization until all other required federal, state, and local approvals, licenses and permits necessary for commencement of work onsite have been obtained.
25. A complete, legible copy of this permit shall be kept at the work site and shall be exhibited upon request of any person.
26. The permittee shall allow the Program the right to inspect the construction site and also shall provide the Bureau of Coastal and Land Use Compliance and Enforcement, NJDEP, 401 East State Street, P.O. Box 422, Trenton, New Jersey 08625 with written notification 7 days prior to the start of the authorized work.
27. This authorization is valid for five years from the date of this letter unless more stringent standards are adopted by rule prior to this date.

Transition Area

The wetlands affected by this permit authorization are of Ordinary and Intermediate resource value. The wetland located associated with the drainage channel located along the eastern side of the site are classified as Ordinary resource value. No standard transition area is required adjacent to Ordinary resource value wetlands. The wetlands located on the adjacent Wharton Enterprise property are classified as Intermediate resource value and have a standard required transition area or buffer of 50 feet. In addition, all of the wetlands are classified as priority wetlands by the United States Environmental Protection Agency since they drain into the Passaic River Basin. This General Permit includes a transition area waiver that allows encroachment only in that portion of the transition area that has been determined by the Department to be necessary to accomplish the regulated activities. Any additional regulated activities conducted within the standard transition area shall require a separate transition area

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waiver from the Program. Regulated activities within a transition area are defined at N.J.A.C. 7:7A-2.6.

Consistency with the Areawide Water Quality Management Plan

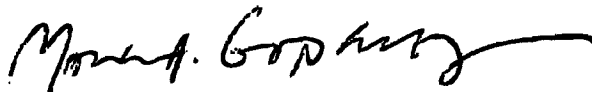
This project has not been reviewed for consistency with the relevant Water Quality Management Plan or Statewide Water Quality Management Planning Rules (N.J.A.C. 7:15). As such, there is no intended or implied approval regarding additional permits which may be required from the Department. For treatment works approvals, the consistency determination will be performed by the Bureau of Engineering and Permitting (North/South) which may be contacted at (609) 292-6894 for North (Middlesex, Hunterdon and Counties north) or (609) 633-1139 for South (Mercer, Monmouth and Counties south). For general information concerning the water quality management planning process, please contact the Division of Watershed Management at (609) 633-1179.

Appeal of Decision

In accordance with N.J.A.C. 7:7A-1.7, any person who is aggrieved by this decision may request a hearing within 30 days of the decision date by writing to: New Jersey Department of Environmental Protection, Office of Legal Affairs, Attention: Adjudicatory Hearing Requests, P.O. Box 402, Trenton NJ 08625. This request must include a completed copy of the Administrative Hearing Request Checklist.

If you have any questions regarding this authorization, please contact Susan Michniewski of our staff at (609) 633-9277. Please reference the above file number.

Sincerely,



Mark A. Godfrey, Supervisor
Morris & Bergen Counties Region
Bureau of Inland Regulation

Attachments (map sketch, mitigation forms)

- c. Anthony Cinque, Site Remediation Program
- Jodale Legg, Land Use Regulation Program – Mitigation Unit
- Nadine White, Land Use Regulation Program
- Bureau of Coastal and Land Use Compliance and Enforcement
- Wharton Borough Clerk
- Wharton Borough Construction Official
- Wharton Borough Planning Board
- Wharton Borough Environmental Commission